PRELIMINARY SCIENCE RESULTS FROM THE SIR-C/X-SAR MISSION

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The SIR-C/X-SAR instrument flew two highly successful flights in April and October 1994 on board the space shuttle Endevour. This paper will describe quantitative results from the analysis of data acquired during these two flights.

The SIR-C/X-SAR instrument collected data at three frequencies (1.-, C- and X-band) and in the fully polarimetric mode at L- and C-bands. The data produced by the ground processing systems are routinely calibrated before distribution. We will describe here the following science results:

1. Using the full capabilities of the data, the University of Michigan developed a land cover classification algorithm with a demonstrated accuracy better than 90%. This algorithm works in two steps; first, the image is classified into broad classes such as short vegetation, tall vegetation and bare surfaces. In the next step, the tall vegetation is further classified into excurrent and decurrent vegetation types.

2. Using L.-band HH and VV images, an algorithm developed at JPL has demonstrated an accuracy of 4% when inferring soil moisture from the radar data. A surface roughness map is also produced as a product. Soil moisture maps of the Chickasha, Oklahoma supersite will be presented.

3. The University of California, Santa Barbara used the multi-parameter capability of the data to develop an algorithm to classify inundated forests. Results from the Manaus supersite will be presented.

4. Snow wetness maps were produced by the University of California, Santa Barbara of the Mammoth Mountain supersite in California. The demonstrated accuracy is on the order of 1-290.

5. Using data acquired by the AIRSAR system and comparing that to data acquired by SIR-C/X-SAR, maps of vegetation regrowth and destruction were made for the Landes Forest in France.

6. Using field data acquired during the BOREAS experiment, SIR-C/X-SAR data were related to forest biomass and land cover type. Maps of above ground biomass and forest cover were made using the L-band to C-band cross-polarized ratio and a SAR classifier.